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ABSTRACT

This study investigated whether dominance relations observed during free-play are apparent in children's drawings of themselves with another classmate. A total of 16 hours of observational data were collected from 37 children, 9 to 11 years of age, during 40-minute free-play periods in their school setting. Dominance assessments were based upon repeated daily recordings of agonistic interactions. Following 5 weeks of observation, all of the children were asked to draw a picture of themselves and a friend. The drawings of 18 children (who each drew someone within their social group) were analyzed initially by two judges for detail of each figure. Each drawing was also scored for closest distance between figures, farthest distance between figures, figure orientation, relative height of figures, and relative percent of page occupied by each figure. Subsequently, eight different judges independently rated the set of 18 drawings on maturity of style, friendliness, amount of interaction, hostility, and social dominance. Results provide evidence that: (1) adult judges do perceive social dominance differences of children's drawings of themselves and a classmate; (2) inter-judge assessments are reliable; and (3) judgments are correct with respect to observed dominance differences. (ED)

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The Representation of Social Dominance in Children's Drawings

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The main questions which gave form to the present research grew out of naturalistic assessments of social relations among young children. We had found, for example, that one aspect of peer-group social organization is a stable linear dominance hierarchy similar to that found with many other primates. Episodes of dyadic conflict among children (object position struggles, threats, attacks and submissions) are organized so that the relative dominance status of individuals within the group conforms to the transitivity rule of the linear dominance model. Given that child A wins in an agonistic encounter with B, and B win from C, then a linear hierarchy can be formed with A most dominant. This model predicts that child A should not lose during conflict with child C. All our observations of young children's social dominance do fit very well with this model (Strayer, 1975a; Strayer, 1975b; Strayer & Strayer, 1975).

What we were then interested in knowing was whether the children themselves were aware of the social dominance structure operating within their group. One way of assessing this is to ask them directly - though this task does have its own set of problems. I won't tell you about children's verbal reports concerning their social dominance relations at this time, but rather would like to propose another route for investigating children's implicit perception of their social relations. This ~~latter~~

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route was to ask children to draw a picture of themselves and a friend. What we then explored was whether children are aware on a representational (or psychological) level of social relationships evident from an ethological analysis of their spontaneous behaviour. Assuming that children might be implicitly aware of such relationships, we wanted to know if you, an independent judge unacquainted with the children, could correctly assess relative dominance relations from drawings alone. Finally, assuming such assessments were possible, we wanted to know how such social information is conveyed.

The use of drawings as a psychological tool has had an erratic history, often divergent from mainstreams of empirical investigation. Children's drawings, in particular, have been of theoretical interest from a variety of viewpoints. An argument for progressive changes in representational and symbolic development shown in children's drawings has been made by Piaget (1962) and Werner (1961). Basic principles of perceptual organization are thought to be evident in children's art (Arnheim, 1965). Children's drawings have also served as measures of intelligence (Harris, 1963), maturation (Kellogg & O'Dell, 1967), and as projective techniques for assessing creativity, social development, personality, and psychopathology (Bettleheim, 1959; Lebo, 1962; Lowenfeld, 1970; and Machover, 1964).

Notwithstanding the diverse theoretical interest children's drawings have provoked, their usefulness as a psychological technique has been criticized on grounds that drawings have not been developed as a tool that would give reliable differentiation (Anastasi, 1958). The difficulties of using drawings as measures of individual differences seems better understood upon consideration of at least three potential sources of confusion.

The first problem is to establish, independently of the drawing, the ecological validity of the criterion which the drawing is presumed to index: the problem of defining the criterion in the 'real' world. The next problem is how to measure this in the drawing. Finally, the most critical problem has been given the least attention: the demonstration of reliable relationships among drawing measures and the behavioral criterion. The most obvious difficulties arise when psychological criteria are extracted entirely from differences among drawings themselves. In contrast, the present study gives priority to the demands of providing an ecologically valid criterion and then to investigating children's drawings in relation to it.

We examined the value of drawings as an index of social relations among peers. Drawings have not traditionally been extended to this area. The approach used was first to determine by naturalistic methods the social dominance structure of a group of elementary school children, and then to see if the observed dominance relations would be apparent to independent adult judges rating drawings by these children of themselves and a classmate. An important corrollary was to assess <u>how</u> information about social dominance might be graphically conveyed.

The measures used to assess drawings included (1) judges' ratings of various social dimensions such as friendliness, hostility, and amount of interaction as well as dominance, and (2) graphic measures such as detail differentiation, figure orientation, relative percent of page occupied, etc. The primary interest was to determine whether dominance relations observed during free-play would be apparent in drawings by these same children of themselves with another classmate.

Method

Thirty-seven children, ranging in age from nine to 11 years, were observed during 40 minute free-play periods in their school setting. Dominance assessments were based upon repeated daily recordings of agonistic interactions (Strayer & Strayer, 1975). A total of 16 hours of observational data were collected. Three major categories of dyadic agonism were scored: Physical Attack, including forms of body contact such as hits, kicks, and wrestling; Threat Gestures, including face and body postures, as well as intention movements resembling attack but not resulting in body contact; and Object/Position Struggles entailing attempts to usurp objects or spatially to supplant another child. In each record of conflict both the "winner" and "loser" were noted. The "winner" was defined as the child who initiated the final agonistic act in a conflict sequence; while the other member of the dyad was the "loser". If a particular instance of conflict appeared to be more playful than genuine agonism, the interaction was not used in the assessment of dominance status. A total of 124 genuine agonistic interactions were scored. Systematic comparison of dyadic wins and losses resulted in a linear dominance hierarchy which accounted for approximately 94% of the observed interaction, and all of the observed dyadic dominance relations.

[Insert Fig. 1. Dominance Hierarchy]

Figure 1 is a summary of the social dominance rankings in the group. The circles are girls, and the squares are boys. The filled units represent children who drew a friend also within the observed group. Clusters along the same row indicate tied status. A, B, and C indicate High, Medium

and Low-status subgroups. You can note that the bottom row D represents girls who could not be assigned a status ranking since they did not engage in any agonistic interactions. The next figure shows you how these various dominance subgroups interacted.

[Insert Figure 2]

Figure 2 is a summary of conflict among the High, Medium, Low-status and No-agonism subgroups. Members of group A win interactions from all other subgroups. Group B wins predominantly from Groups B and C, but seldom from Group A. Members of Group C wins only over individuals from the same subgroup.

Following the five weeks of observation, all of the children were asked during an art period to draw a picture of themselves and a friend. They were given as much time as they needed to complete the picture. Twelve children drew someone outside the observed social group, and their drawings were not considered in this analysis. The 18 children (eight girls and 10 boys) who drew someone within the social group ranged in age from 109 to 133 months (mean = 122.6; S.D. = 9.18).

Figure 3 shows the choices each child made when asked to draw a friend.

[Insert Fig. 3]

All children drew a friend of the same sex. In general, most of the children who were chosen were in the 2 higher subgroups, except for the lowest ranking girls who chose each other. The status difference among dyads is indicated in the last column. Since members of group D did not

engage in conflict and could not be placed within the status structure, drawings in which they appeared were assigned a zero dominance-difference score.

All 18 drawings were analyzed initially for detail of each figure by two judges according to instructions in the Goodenough-Harris manual (1963). The judges did not know the observed dominance status of either figure. Differences in scoring occurred on only three occasions; for these items the judges consulted to provide an agreed-upon score. Each drawing was also scored on each of the following graphic dimensions: Closest Distance between the two figures; Farthest Distance between figures; Figure Orientation (degree to which figures tilted toward or away from each other); Relative Height (ratio of own portrayed height to that of the other figure); and Relative Percent of Page occupied by each figure.

Finally, eight different judges (four males and four females) were asked independently to rate the set of 18 drawings on the following dimensions: Maturity of Style; Friendliness; Amount of Interaction; Hostility; and Social Dominance. Judges were instructed to examine and score all drawings on one dimension before proceeding to the next. The first four dimensions were rated on a seven-point scale. Dominance ratings required judges to indicate if one of the figures appeared more dominant than the other, and to indicate the extent of perceived dominance difference by placing a mark for each figure at any point they thought appropriate along a 15 mm. line. This line was labelled at one end "most submissive" and at the other "most dominant".

Intercorrelations were computed among the six graphic dimensions and observed dominance differences, as well as among the five judgement dimensions and observed dominance differences. Both of these correlations matrices

were analyzed using a Principal Components solution with Normal Varimax rotations.

Results

High inter-judge agreement on each social dimension permitted a pooled consideration of ratings for each dimension. (Pearson Product-Moment correlations ranged from $r = .75$ to $r = .90$, all p's $< .01$). The main question of whether behavioral dominance can be assessed correctly from drawings receives affirmative support. Results provide evidence that adult judges do perceive social dominance differences in children's drawings of themselves and a classmate, that inter-judge assessments are reliable and most importantly, that these judgements are correct with respect to observed dominance differences.

The 18 pictures drawn could be grouped into three post-hoc categories: 8 pictures portrayed a classmate higher in status than the drawer, 4 portrayed a classmate lower in status, and 6 portrayed a classmate tied in status with the drawer. For the 12 drawings for which there was an observed difference between members of the dyads drawn, mean ratings of dominance were 75% correct. For those drawings depicting dyads for whom tied dominance status was observed the distribution of direction judgements was not significantly different from chance. Mean ratings of direction of dominance were 100% correct for the 4 drawings in which the drawer was higher in observed status than the other child drawn, and 63% correct for the 8 drawings in which the drawer was lower in status.

Similar trends were evident in more detailed analyses of individual judgements. Table 1 shows the actual frequencies of judged dominance difference

[Insert Table 1]

for the three post-hoc categories. Judges showed the greatest agreement on dominance difference when the drawer was higher in status than the friend drawn. They were less correct about direction of difference when the drawer was of lower status than the child drawn. Finally, not only direction of dominance differences but also judgements of the extent of dominance difference between the two figures drawn correlated significantly with observed differences in group dominance status ($r = .545$, $p < .01$, $df = 16$). Figures 2 and 3 are reproductions of actual drawings which illustrate the latter finding. In Figure 2 both drawers and classmates are close in observed dominance status, and in Figure 3 there are marked differences.

[Insert Fig. 2 and 3]

In both figures, JO indicates the mean judged dominance difference while OD refers to observed status difference. In all cases the mean judged dominance is highly correlated with extent of observed dominance difference.

Our next interests concerned the relationship of observed dominance to other social dimensions rated and to the graphic variables scored. A Principal Components analysis of the correlations among social dimensions was computed, and four orthogonal factors were indicated: Friendliness-Hostility, Dominance, Amount of Interaction, and Maturity. Both judged and observed dominance differences loaded on the second factor. This analysis underscores the finding that while judged dominance differences are related to observed differences in dominance status, they are independent of the other social dimensions rated.

Our final questions concerned the relationship of both judged dominance differences and observed dominance differences to the graphic dimensions

used in scoring the drawings. The correlations of dominance judgements and observations with graphic measures are shown in Table 2.

[Insert Table 2]

Judgements of dominance correlated most highly with relative percent of page occupied ($r = .58$, $p<.01$, $df = 16$), and relative height ($r = .59$, $p<.01$, $df = 16$). The notion that certain graphic dimensions might be most important for the portrayal of actual observed differences in dominance was also supported. Observed dominance differences correlated significantly with the same graphic dimensions used for the judgement of relative dominance; for relative percent of page, $r = .56$, $p<.01$, $df = 16$; for relative height, $r = .54$, $p<.01$. A Principal Components analysis of intercorrelations between both observed and judged dominance differences, as well as graphic measures revealed two significant factors. Both dominance measures loaded with relative height, relative percent of page, and detail differences on one factor; while distance measures such as closest point, farthest point, and figure orientation comprised the second orthoginal factor.

In summary these findings indicate that judges can perceive differences in dominance status portrayed in children's drawings of themselves with a classmate, and that there is a high percentage of correct judgments with respect to direction and extent of observed dominance differences. The graphic dimensions which were most related to judgements of dominance differences were relative percent of page occupied, relative height, and detail differences. Observed differences in dominance status among children was also significantly correlated with these same graphic dimensions.

Discussion

Whatever the limitations may and should be on making projective inferences from children's drawings, it does appear that judgement ratings and graphic dimensions scored have ecological validity when examined in relation to behavioral observations. Elementary school children portray some social relations when drawing themselves with a classmate, and these are apparent to adult judges. In addition to substantiating the usefulness of drawings as an indirect observational method (McGrew, 1972), these findings may have some useful clinical applications. That children should portray a social dimension, such as dominance, that is relevant to their peer organization ~~(Strayer & Strayer, in preparation)~~ is not surprising. And we now have some indications of <u>how</u> this information is encoded in a drawing. It was noted that when the drawer was higher in status to the classmate drawn, mean judgements of dyadic dominance were 100% accurate. It is possible that graphic ~~means~~ more accentuated for these children. Graphic measures such as relative height, relative percent of page occupied, and detail differences are important in conveying information about dominance status, but a more fine-grained analysis would probably be more informative. It seems likely, for example, that differences in dominance status are portrayed by a combination of drawing variables which are differently weighted, but which together are effective as a basis for judgements which correlate with observed dominance status. Such differential weighting may also vary systematically between individuals, and give some indication of differences in the personal significance of dominance relations for various children.

The use of drawings as a tool for investigating the expression of social variables independently observed seems a valuable and interesting channel connecting indirect and direct methods of observation. Further investigations of why some children drew classmates higher in dominance status and others drew classmates equal to or below themselves may be revealing of personality variables interacting with, or emerging from early peer group social structures. It would, of course, also be interesting to see whether the representation of other social relations such as leadership, affiliation, and cooperation, are amenable to this analytic approach. Finally, it seems worthwhile to investigate whether children, as well as adult judges, perceive particular graphic dimensions in peer drawings as representations of ongoing social relationships.

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Table 1

Judgements of Direction of Dominance

Judgement of Status Difference (Judges=8)	Relative Status of Drawer		
	HIGHER (N=4)	EQUAL (N=6)	LOWER (N=8)
Judged Higher	63%	13%	31%
Judged Equal	31%	55%	31%
Judged Lower	6%	31%	38%

Table 2

Correlations of Judged and Observed Status

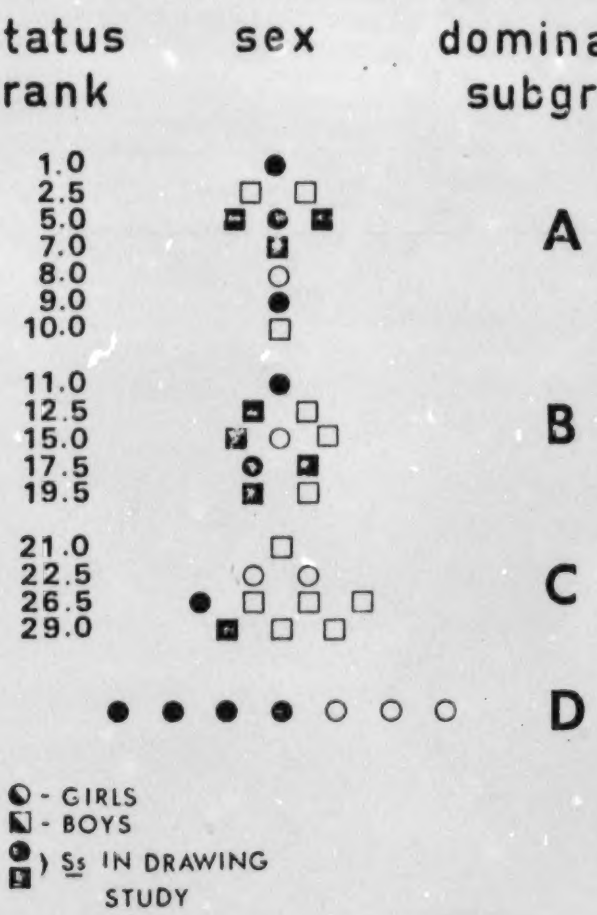
Differences with Graphic Measures

	Judged Dominance Difference	Observed Dominance Difference
Judged Dominance	-	.56**
Observed Dominance	.56**	-
Closest Point	-.21	-.02
Farthest Point	-.18	-.06
Figure Orientation	-.10	.06
Relative Height	.59**	.54*
Relative % of Page	.58**	.56*
Detail Difference	.39	.22

** $p < .01$

* $p < .05$

SUMMARY OF SOCIAL DOMINANCE



SUMMARY OF SUBGROUP CONFLICT

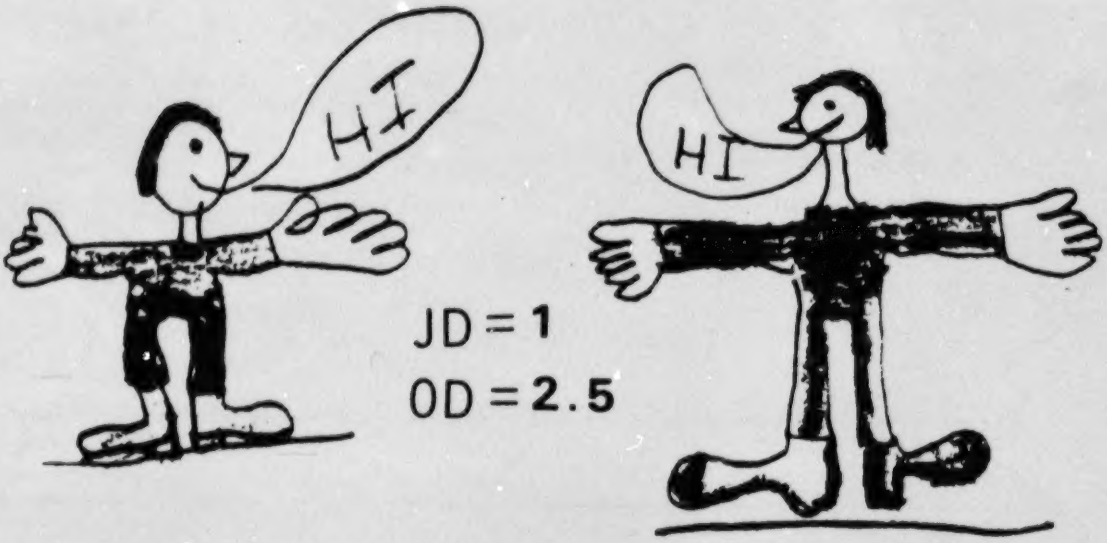
dominance subgroup	wins from: A	B	C	D	total wins
A	22	24	24	0	70
B	3	28	12	0	43
C	0	0	11	0	11
D	0	0	0	0	0
total losses	25	52	47	0	124

DYADIC CHOICES IN DRAWINGS

Drawer	Classmate	Status Difference
1 ●	17.5 ●	+16.5
5 ●	1 ●	-4
5 ■	2.5 □	-2.5
5 ■	7 ■	+2
7 ■	5 ■	-2
9 ●	D ●	0
11 ●	D ○	0
12.5 ■	15 □	+2.5
15 ■	7 ■	-8
17.5 ■	21 □	+3.5
17.5 ●	1 ●	-16.5
19.5 ■	10 □	-9.5
26.5 ●	1 ●	-25.5
29 ■	17.5 ■	-11.5
D ●	D ●	0
D ●	D ●	0
D ●	D ○	0
D ●	D ●	0

other

self

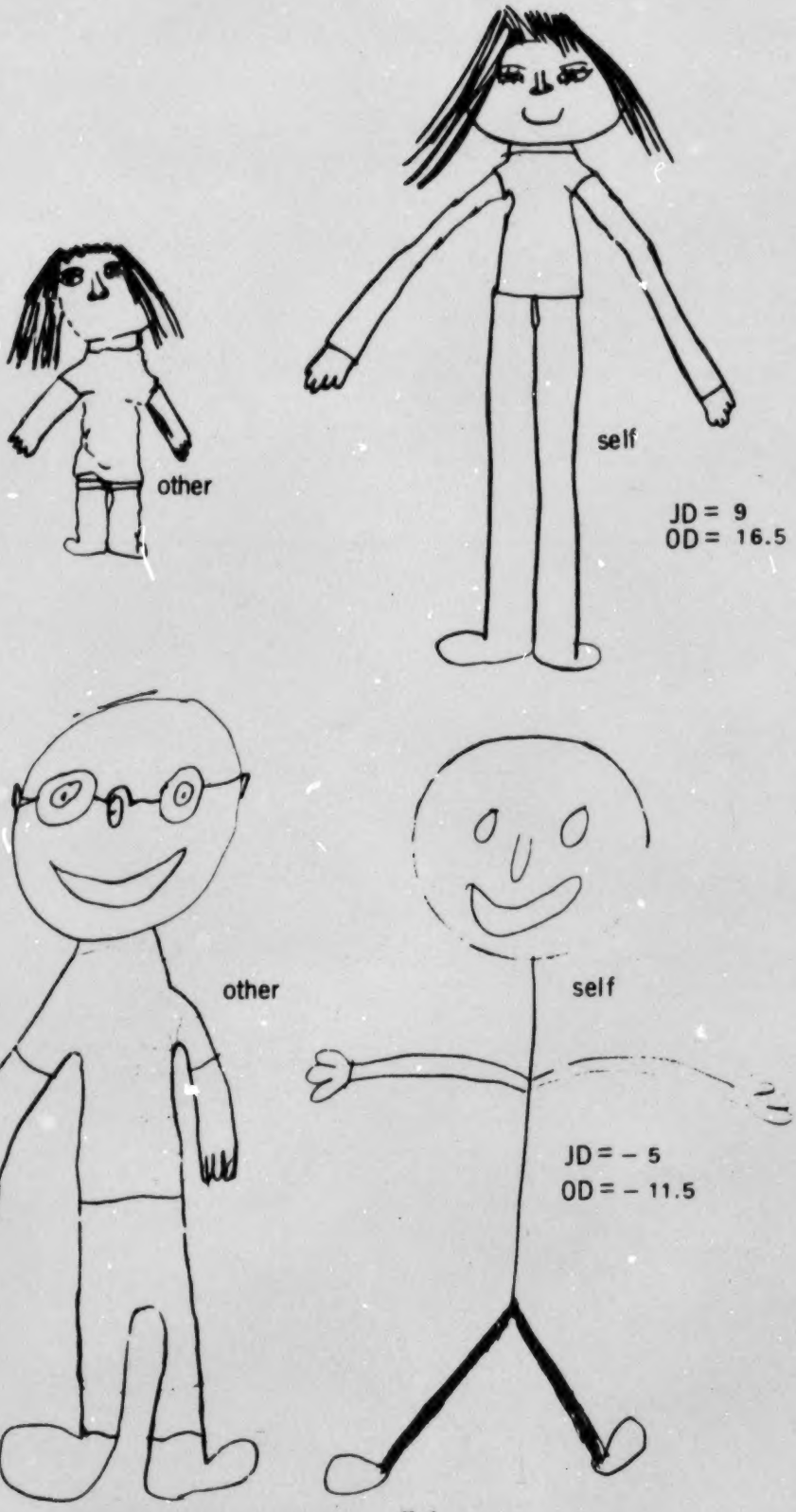


JD = 1
OD = 2.5

other

self

JD = 1
OD = 2


other
self
JD = 9
OD = 16.5
other
self
JD = – 5
OD = – 11.5